Year 10 - Science 2024

<table>
<tr><th colspan="3">TERM 1</th></tr>
<tr><td rowspan="3">TIMING
Weeks: 3</td><td colspan="2">Scientific Report Writing: In this topic, students will carry out a first-hand investigation in an area of science that is of interest to them. They will write a scientific report including all relevant sections. They will conduct a fair test changing only one variable at a time, controlling all other factors. They will gather and analyse a set of primary and secondary data. Students will work both independently to conduct the investigation.</td></tr>
<tr><td>UNIT OVERVIEW</td><td>ASSESSMENT</td></tr>
<tr><td>Students will write a scientific report that includes the following sections:
• Aim
• Hypothesis
• Method
• Variables
• Results including drawing relevant graphs and tables
• Discussion
• Conclusion</td><td>Task Number: 1
Nature of Task:
Student Research Project
Percentage: 20
Week: 8
Reported: Semester 1</td></tr>
<tr><td rowspan="3">TIMING
Weeks: 7</td><td colspan="2">Chemical Reactions: In this topic students learn about chemical reactions; acids, bases and indicators; chemical reactions involving acids, and other kinds of chemical reactions.</td></tr>
<tr><td>UNIT OVERVIEW</td><td>ASSESSMENT</td></tr>
<tr><td>• Recall that all matter is composed of atoms and has mass
• Deduce that new substances are formed during chemical reactions by rearranging atoms rather than creating or destroying them
• Identify a range of compounds using their common names and chemical formulae
• Classify compounds into groups based on common chemical characteristics
• Investigate a range of types of important chemical reactions that occur in non-living systems and involve energy transfer, including:
  ○ precipitation
  ○ combustion
  ○ corrosion
  ○ reaction of acids including metals and carbonates
  ○ neutralisation
• decomposition
• Identify some examples of important chemical reactions that occur in living systems and involve energy transfer, including respiration and reactions involving acids such as occur during digestion
• Construct word equations from observations and written descriptions of a range of chemical reactions
• Balance a range of common chemical equations
• Identify that chemical reactions involve energy transfer and can be exothermic or endothermic
• Compare combustion and respiration as types of chemical reactions that release energy but occur at different rates</td><td></td></tr>
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TERM 1 (continued)		
	UNIT OVERVIEW: Chemical Reactions (continued)	**ASSESSMENT**
	• Describe the effects of factors, e.g., temperature and catalysts, on the rate of some common chemical reactions • Analyse how social, ethical, and environmental considerations can influence decisions about scientific research related to the development and production of new materials • Describe examples to show where advances in science and/or emerging science and technologies significantly affect people's lives, including generating new career opportunities in areas of chemical science such as biochemistry and industrial chemistry • Research ways that are used to restore and prevent corrosion of submerged objects	
TERM 2		
TIMING Weeks: 10	**Genetics and Evolution:** Starting from their prior knowledge on cells and body systems in Stage 4 students will learn about DNA - the genetic information needed to accurately reproduce the same type of living thing which is located in the nucleus of every living cell. How this information is transferred from generation to generation and how these impacts and provides the mechanism for biological evolution. In this topic, students will learn about and develop understanding of the theory of evolution by Natural Selection. Identify the parts of DNA and explain how the transfer of information impacts and is the mechanism for biological evolution.	
	UNIT OVERVIEW	**ASSESSMENT**
	• Identify that living things are made of cells • Identify structures within cells, including nucleus, cytoplasm, cell membrane, cell wall and chloroplast; describe their functions • Outline the role of cell division in growth, repair, and reproduction in multicellular organisms • Identify that new cells are produced by cell division • Distinguish between unicellular and multicellular organisms • Relate the organs involved in human reproductive systems to their function • Identify that during reproduction transmission of heritable characteristics from one generation to the next involves DNA & genes • Identify that genetic information is transferred as genes in the DNA of chromosomes • Outline how the Watson-Crick model of DNA explains the exact replication of DNA - changes in genes (mutation) • Describe, using examples, how developments in technology have advanced biological understanding, e.g., vaccines, biotechnology, stem-cell research, and in-vitro fertilisation • Discuss some advantages & disadvantages of the use & applications of biotechnology, including social and ethical considerations • Classify a variety of living things based on similarities and differences in structural features • Classify, using a hierarchical system, a range of selected plants and animals to species level • Describe scientific evidence that present-day organisms have evolved from organisms in the past • Relate the fossil record to the age of the Earth and the time over which life has been evolving • Explain, using examples, how natural selection relates to changes in a population, e.g., in the development of resistance of bacteria to antibiotics and insects to pesticides • Outline the roles of genes and environmental factors in the survival of organisms in a population	Task Number: 2 Nature of Task: Semester 1 Examination Percentage: 20 Week: 3 Reported: Semester 1

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<tr><th colspan="3">TERM 3</th></tr>
<tr><td rowspan="3">TIMING
Weeks: 10</td><td colspan="2">Motion: Motion is describing movement. In this topic, students will describe the motion of vehicles, this can be in a straight line, in circles, to and fro or at random. Will identify that some types of motion are predictable and can be explained mathematically while random motion cannot. There are many ways that motion can be measured and predicted through the application of laws and mathematical equations. Understanding motion is very important if you are to become a safe and aware driver. Understanding the motion of your car and how it behaves in different circumstances is very important.</td></tr>
<tr><td>UNIT OVERVIEW</td><td>ASSESSMENT</td></tr>
<tr><td>• Describe qualitatively the relationship between force, mass and acceleration
• Explain qualitatively the relationship between speed, distance and time
• Relate acceleration qualitatively to a change in speed and/or direction as a result of a net force
• Analyse qualitatively everyday situations involving motion in terms of Newton's laws
• Relate motion to car travel and investigate aspects of car safety and vehicle behaviour in different circumstances
• Describe the relationships between displacement, time, velocity and acceleration, using the equations of motion</td><td>Task Number: 3
Nature of Task:
Newton’s Laws and Car Safety
Percentage: 20
Week: 8
Reported: Semester 2</td></tr>
<tr><th colspan="3">TERM 4</th></tr>
<tr><td rowspan="3">TIMING
Weeks: 10</td><td colspan="2">Sustainable Living: In this topic, students will be able to classify the relationships between organisms in ecosystems and predict how they will respond to changes such as deforestation, introduced species or extinction. Students will be able to appreciate the sustainability of the Aboriginal and Torres Strait islanders’ practices towards the land and compare them to the farming methods of early settlers. In learning about the functioning of ecosystems, students will be able to describe the importance of conservation and explore methods that can be employed currently to conserve natural resources.</td></tr>
<tr><td>UNIT OVERVIEW</td><td>ASSESSMENT</td></tr>
<tr><td>• Recall that ecosystems consist of communities of interdependent organisms and abiotic components of the environment
• Outline using examples how matter is cycled through ecosystems such as nitrogen
• Describe how energy flows through ecosystems, including input and output through food webs
• Analyse how changes in some biotic and abiotic components of an ecosystem affect populations and/or communities
• Assess ways that Aboriginal and Torres Strait Islander peoples' cultural practices and knowledge of the environment contribute to the conservation and management of sustainable ecosystems
• Evaluate some examples in ecosystems, of strategies used to balance conserving, protecting, and maintaining the quality and sustainability of the environment with human activities and needs
• Investigate how models can be used to predict the changes in populations due to environmental changes, e.g., the impact of fire or flooding, introduction of a disease or predator
• Discuss the strengths and limitations of using models to make predictions about changes in biological systems</td><td>Task Number: 4
Nature of Task:
Yearly Examination
Percentage: 40
Week: 4
Reported: Semester 2</td></tr>
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